PATENT
Case Docket No.: 46053

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: :
                                         :
Kyung-Eun Lee et al.   :   Group Art Unit: 2623
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Serial No.: 10/724,161   :   Examiner: Boss, Brock N
                                         :
Filed: December 1, 2003   :   Confirmation No.: 9389
                                         :
For: DIGITAL MULTIMEDIA   :
      BROADCASTING RECEIVER   :
      AND METHOD FOR   :
      REPRODUCING DIGITAL   :
      MULTIMEDIA DATA   :

SUPPLEMENT TO RESPONSE

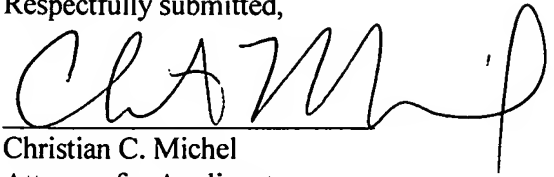Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please find enclosed an English translation of the priority document to
supplement the response filed on May 14, 2008. The English translation is submitted
in support of Applicants' assertion that Applicants' priority date is earlier than the
filing date of Kondou. Since the August 27, 2003 priority date of the present
application is earlier than the September 15, 2003 U.S. filing date of Kondou et al.,
Kondou et al. is not prior art, and the § 102(e) rejection is improper.

Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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Dated: May 21, 2008

CERTIFICATE OF TRANSLATION

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of a priority document with respect to the Korean patent application No. **2003-59555** filed on **August 27, 2003**.

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CITIZENSHIP : REPUBLIC OF KOREA

THE KOREAN INTELLECTUAL PROPERTY OFFICE

This is to certify that annexed hereto is a true copy from the records of the Korean Intellectual property Office of the fo llowing application as filed

Application Number : Korean Patent Application No. 2003-59555

Date of Application : August 27, 2003

Applicant(s) : Samsung Electronics Co., Ltd.

COMMISSIONER

[ABSTRACT OF THE DISCLOSURE]

The present invention relates to a device and a method for receiving digital broadcasting data, and more particularly to a device and a method for providing digital

5 multimedia services in a digital multimedia broadcasting receiver having a conditional access function.

There is provided a hybrid digital broadcasting receiver capable of reproducing digital multimedia data, which includes a broadcast receiving module and a decoder module, wherein said broadcast receiving module comprises: a receiving section for

10 receiving and demodulating a digital broadcasting data stream into which a plurality of compressively encoded and scrambled programs are multiplexed and transmitted; a first demultiplexer for demultiplexing the demodulated digital broadcasting data stream and extracting digital broadcasting data corresponding to a program selected by a user; and a conditional access section for detecting conditional access information and decrypting

15 the selected digital broadcasting data using the detected information, and wherein said decoder module comprises: a second demultiplexer for demultiplexing a digital multimedia data stream of which a plurality of compressively encoded digital multimedia data are multiplexed; and a decoding section for decoding digital broadcasting data outputted from the broadcast receiving module and digital multimedia

20 data outputted from the second demultiplexer.

[REPRESENTATIVE DRAWING] FIG. 2

[INDEX] DMB, digital multimedia broadcasting, digital multimedia service,
25 conditional access, CAS, demultiplexer

[SPECIFICATION]

[TITLE OF THE INVENTION]

5   AN APPARATUS AND METHOD FOR REPRODUCING DIGITAL MULTIMEDIA DATA IN A DIGITAL MULTIMEDIA BROADCASTING RECEIVING TERMINAL

[BRIEF DESCRIPTION OF THE DRAWINGS]

10   FIG. 1 illustrates a block diagram showing the configuration of a conventional digital multimedia broadcasting receiver.

FIG. 2 illustrates a block diagram showing the configuration of a hybrid digital multimedia broadcasting receiver according to the present invention.

FIG. 3 illustrates a flow chart showing a process of reproducing digital
15 multimedia data in a hybrid digital multimedia broadcasting receiver according to the present invention.

[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]

[OBJECT OF THE INVENTION]

20 **[RELATED FIELD AND PRIOR ART OF THE INVENTION]**

The present invention relates to a device and a method for receiving digital broadcasting data, and more particularly to a device and a method for providing digital multimedia services in a digital multimedia broadcasting receiver having a conditional access function.

25   In digital multimedia broadcasting (DMB), digital broadcasting data of a plurality of programs compressed by a highly efficient compression algorithm, such as the MPEG (Moving Picture Expert Group) algorithm, is multiplexed and broadcasted as digital broadcast waves through a satellite transponder or a terrestrial repeater. In other words, digital broadcasting data is divided into video and audio data and then
30 compressed. The compressed data is broken up into predetermined transmission units called transport packets (TP) and multiplexed into a transport stream (TS) to be

transmitted. Digital broadcasting data for a plurality of programs is multiplexed in each transport stream. A user can select a program from the multiplexed broadcasting data.

FIG. 1 shows the configuration of a conventional digital multimedia broadcasting receiver. The conventional digital multimedia broadcasting receiver comprises an antenna 10, a DMB receiving module 20, a decoder module 30, a display section 50 and a speaker 60. Digital multimedia broadcasting, which is basically pay broadcasting, adopts a conditional access system (CAS) to restrict access to certain broadcasting programs. The DMB receiving module 20 and the decoder module 30 are each formed in a single chip. A conditional access section 33 for conditional access services is included in the decoder module 30.

In the conventional DMB receiver, digital broadcasting data received through the antenna 10 is reproduced into the original transport stream by a demodulator 21 of the DMB receiving module 20. The reproduced transport stream is corrected by an error correcting section 23 and inputted to the decoder module 30. A TS demultiplexer 31 of the decoder module 30 demultiplexes the transport stream into which digital broadcasting data for a plurality of programs are multiplexed. The decoder module 30 extracts transport packets that include digital broadcasting data for a program selected by the user. At this time, the digital broadcasting data is scrambled for conditional access and then transmitted. The conditional access section 33 of the decoder module 30 descrambles or decrypts the scrambled digital broadcasting data using a scrambling key generated by a smart card 40. The decrypted digital broadcasting data is decoded by an MPEG video decoder 35 and an MPEG audio decoder 37 of the decoder module 30, and provided to the users through the display section 50 and the speaker 60.

As explained above, in digital multimedia broadcasting, a plurality of programs are multiplexed into a single transport stream to be transmitted. In the conventional DMB receiver, all programs included in a transport stream received by the DMB receiving module 20 are transferred to the decoder module 30. Generally, data transmission between chips is made through a PAD that consumes large amounts of power. There may be some problems when the conventional DMB receiver that transfers all transport streams received by the DMB receiving module 20 to the decoder module 30 is applied directly to a mobile terminal having a limited power resource.

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Accordingly, it is necessary to minimize the amount of data transferred to each module of the DMB receiver and thereby to reduce the power consumption.

Digital data compression techniques have been rapidly developed. In the conventional DMB receiver, however, the decoder module 30 includes the conditional access section 33 as well as a decoding section for decompression. Even when the decoding section need only be changed, the entire decoder module 30 including the conditional access section 33 must be replaced. Thus, it has been necessary to develop a technique for changing the decoding section only independently of the conditional access section 33.

Recent development of digital technologies has driven a new trend of digital integration that eliminates the functional boundary of each digital product. In order to keep up with this new trend, studies have been made to provide mobile terminals, such as cellular phones or PDAs (Personal Data Assistants), with a function for receiving digital multimedia broadcasting. However, as stated above, a conventional digital multimedia broadcasting receiver has a structure that decrypts demultiplexed digital broadcasting data at the conditional access section and then decodes the data at the decoding section. The decoder module of such a conventional DMB receiver has a problem in reproducing digital multimedia data other than digital broadcasting data. In order to install the conventional DMB receiver in a mobile terminal, an additional decoding section is required to reproduce non-scrambled multimedia data. However, a plurality of decoding sections, if provided in a mobile terminal having a limited power resource, will cause power problems and make it difficult to form a mobile terminal of small size.

[SUBSTANTIAL MATTER OF THE INVENTION]

Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and an object of the present invention is to provide a device and a method for reducing data traffic between each module of a digital multimedia broadcasting receiver.

Another object of the present invention is to provide a hybrid mobile terminal

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capable of receiving digital multimedia broadcasting and reproducing other multimedia data.

Still another object of the present invention is to provide a hybrid digital multimedia broadcasting receiver capable of providing various multimedia services.

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In order to accomplish the above objects, there is provided a hybrid digital broadcasting receiver capable of reproducing digital multimedia data, which includes a broadcast receiving module and a decoder module, wherein said broadcast receiving module comprises: a receiving section for receiving and demodulating a digital
10 broadcasting data stream into which a plurality of compressively encoded and scrambled programs are multiplexed and transmitted; a first demultiplexer for demultiplexing the demodulated digital broadcasting data stream and extracting digital broadcasting data corresponding to a program selected by a user; and a conditional access section for detecting conditional access information and decrypting the selected
15 digital broadcasting data using the detected information, and wherein said decoder module comprises: a second demultiplexer for demultiplexing a digital multimedia data stream of which a plurality of compressively encoded digital multimedia data are multiplexed; and a decoding section for decoding digital broadcasting data outputted from the broadcast receiving module and digital multimedia data outputted from the
20 second demultiplexer.

There is also provided a hybrid multimedia broadcasting receiver including: a receiving section for receiving a digital broadcasting data stream into which digital broadcasting data packets and conditional access information packets for a plurality of programs are multiplexed and transmitted; a first demultiplexer for separating the
25 conditional access information packets and digital broadcasting data packets for a program selected by a user from the received digital broadcasting data stream; a conditional access section for detecting conditional access information from the conditional access information packets and decrypting the separated digital broadcasting data packets using the conditional access information; a second demultiplexer for
30 receiving a digital multimedia data stream into which compressively encoded audio packets and video packets are multiplexed and separating the audio packets and the video packets from the digital multimedia data stream; and a decoding section for

decoding digital broadcasting data packets outputted from the conditional access section and audio packets and video packets outputted from the second demultiplexer, wherein said receiving section, first demultiplexer and conditional access section are formed in a first integrated circuit chip while said second demultiplexer and decoding section are

5 formed in a second integrated circuit chip.

There is also provided a device for processing digital broadcasting data, which includes: a receiving section for receiving and demodulating a digital broadcasting data stream into which digital broadcasting data packets and conditional access information packets for a plurality of programs are multiplexed and transferred; an error correcting

10 section for correcting an error in the demodulated digital broadcasting data stream; a demultiplexer for separating the conditional access information packets and digital broadcasting data packets for a program selected by a user from the demodulated digital broadcasting data stream; and a conditional access section for detecting conditional access information from the conditional access information packets and decrypting the

15 separated digital broadcasting data packets using the conditional access information, wherein said device is formed in a single integrated circuit chip.

Further, in order to accomplish the above objects, there is provided a method for providing digital multimedia services in a hybrid digital broadcasting receiver which includes a broadcast receiving module for processing digital broadcasting data and a

20 decoder module for processing compressively encoded digital data, said method comprising the steps of: receiving at the broadcast receiving module a digital broadcasting data stream into which a plurality of scrambled programs and conditional access information are multiplexed and transferred; separating the conditional access information and digital broadcasting data for a program selected by a user from the

25 digital broadcasting data stream received at the broadcast receiving module and decrypting the separated digital broadcasting data using the conditional access information; decoding at the decoder module the digital broadcasting data inputted from the broadcast receiving module; receiving at the decoder module a digital multimedia data stream into which compressively encoded audio data and video data are

30 multiplexed; and demultiplexing at the decoder module the digital multimedia data stream to separate the audio data and the video data and decoding the separated audio data and video data.

[CONSTRUCTION AND OPERATION OF THE INVENTION]

Hereinafter, a preferred embodiment of the present invention will be described with reference to the accompanying drawings. In the drawings, the same element, although depicted in different drawings, will be designated by the same reference numeral or character. Also, in the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

FIG. 2 is a block diagram showing the configuration of a hybrid digital multimedia broadcasting receiver according to the preferred embodiment of the present invention. Hereinafter, the configuration and operation of the hybrid digital multimedia broadcasting receiver will be explained in detail with reference to FIG. 2.

The hybrid digital multimedia broadcasting receiver comprises an antenna 210, a broadcast receiving module 220, a decoder module 230, a multimedia module 260, a display section 241 and a speaker 243.

The antenna 210 receives digital broadcast waves in which digital broadcasting data for a plurality of programs are multiplexed and transmitted. The digital broadcasting data is compressively encoded. The digital broadcasting data includes at least one of video data, audio data and additional data which are broken up into predetermined transmission units called packets. The video data and the audio data are compressively encoded according to a conventional compression algorithm, such as H.264 (MPEG4 p.10) or MPEG4 AAC. The additional data includes image data and text data, such as caption relating to speech data. The divided transport packets are scrambled using a scrambling key for conditional access and multiplexed into a single digital broadcasting data stream, i.e., a transport stream.

The broadcast receiving module 220 includes a demodulator 221, an error correcting section 223, a TS demultiplexer 225 and a conditional access section 227. The broadcast receiving module 220 separates a transport stream of digital broadcasting data corresponding to a program selected by the user from the digital broadcasting data received through the antenna 210. The broadcast receiving module 225 decrypts the scrambled digital broadcasting data and outputs the decrypted data to the decoder module 230 via an interface (not shown).

The demodulator 221 amplifies digital broadcast waves received through the antenna 210. After frequency conversion, the demodulator 221 shapes and demodulates the signal waveforms to reproduce the original transport streams. Also, the demodulator 221 extracts from the demodulated transport streams a transport stream

5 of a particular channel on which a program selected by the user is broadcasted, and outputs the extracted transport stream to the error correcting section 223. The error correcting section 223 corrects a signal error in the transport stream.

The TS demultiplexer 225 includes a section filter. The TS demultiplexer 225 demultiplexes the transport stream and separates transport packets of digital

10 broadcasting data corresponding to the selected program. The separated packets include at least one of audio data, video data and additional data according to the selected program. The conditional access section 227 includes a descrambler 228 and a packet filter 229. The conditional access section 227 decrypts the digital broadcasting data using a scrambling key generated by a smart card 250. The

15 operation performed in the broadcast receiving module 220 will be explained in detail with reference to FIG. 3.

The decoder module 230 includes a TS demultiplexer 231, a video decoder 233 and an audio decoder 235. Although not shown in the drawings, an additional data decoder may also be included in the decoder module 230. The operation of the TS

20 demultiplexer 231 is similar to that performed by the TS demultiplexer 225 of the broadcast receiving module 220. The TS demultiplexer 231 demultiplexes a digital multimedia data stream into which compressively encoded video data and audio data are multiplexed. However, the TS demultiplexer 231 of the decoder module 230 is distinguished from the TS demultiplexer 225 of the broadcast receiving module 220 in

25 that it supports reproduction of various digital multimedia data other than digital broadcasting data.

The digital multimedia data stream is supplied from the multimedia module 260. Although the present invention is explained herein based on the assumption that the multimedia module 260 includes a CDMA receiving module 261, a multimedia

30 game module 263 and a digital music module 265, the multimedia module 260 can be modified to exclude a certain module or include any other module for providing digital multimedia services. The CDMA module 261 provides data, such as MOD (Music On Demand) or VOD (Video On Demand), received via a mobile communication network. The multimedia game module 263 provides multimedia game data. The digital music

35 module 265 provides digital music data useful for singing machines.

The video decoder 233 and the audio decoder 235 decode the data outputted from the TS demultiplexer 231 and that outputted from the broadcast receiving module

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220, and output the two data to the display section 241 and the speaker 243, respectively. The smart card 250 stores data and programs for decrypting the conditional access code. The smart card 250 receives and transmits data to and from the conditional access section 227 through a smart card interface, which is not shown in
5 the drawings.

FIG. 3 is a flow chart showing a process of reproducing digital multimedia data in a hybrid digital multimedia broadcasting receiver according to the preferred embodiment of the present invention. Hereinafter, a method for providing various digital multimedia services, including digital broadcasting, in the digital multimedia
10 broadcasting receiver will be explained in detail with reference to FIGs. 2 and 3.

At step 301, the DMB receiver determines whether there is a request for receiving digital multimedia broadcasting from the user. If there is such a request, the DMB receiver will proceed with step 303. At step 303, the DMB receiver drives the broadcast receiving module 220 for processing digital broadcasting data and proceeds
15 with step 305.

At step 305, the DMB receiver receives digital broadcast waves through the antenna 210. The demodulator 221 amplifies the digital broadcast waves. After frequency conversion, the demodulator 221 shapes and demodulates signal waveforms to reproduce the original transport streams. The demodulator 221 extracts a transport
20 stream of a particular channel on which a program selected by the user is delivered, and outputs the extracted transport stream to the error correcting section 223. At step 307, the error correcting section 307 correct any signal error in the reproduced transport stream.

At step 309, the TS demultiplexer 225 separates PAT (Program Association
25 Table) transport packets from the error-corrected transport stream and analyzes the packets. The PAT containing a complete list of all program control information is always carried in packets with PID (packet ID) = 0. At step 309, the TS demultiplexer 225 proceeds with step 311 and 315. At step 311, the TS demultiplexer 225 detects PIDs of the PMT (Program Map Table) corresponding to the program selected by the
30 user. At step 313, the TS demultiplexer 225 separates transport packets corresponding to the selected program from the transport stream using the detected PIDs, and provides the separated packets to the conditional access section 227. Those transport packets are the digital broadcasting data that constructs the selected program. They are scrambled for the purpose of conditional access.
35 A scrambling key for descrambling the scrambled transport packets is generated using the ECM (Entitlement Control Message) and the EMM (Entitlement Management Message). The ECM consists of program attribute information and ECM

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packets, while the EMM consists of contract information of each user and EMM packets. The ECM and EMM messages are transmitted together with scrambled transport packets of video and audio data.

Steps 315 to 325 for generating a scrambling key will be explained in more detail. At step 315, the TS demultiplexer 225 extracts PIDs of CAT (Conditional Access Table) packets and PMT (Program Map Table) packets containing ECM information. At step 317, the TS demultiplexer 225 separates the CAT packets and the PMT packets from the transport stream using the PIDs and analyzes the separated packets. At step 319, the TS demultiplexer 225 detects PIDs of EMM and ECM packets from the CAT and PMT packets and proceeds with step 321. At step 321, the PIDs of the EMM and ECM packets are sent to the conditional access section 227 and set to values of a packet filter 229. The packet filter 229 detects EMM and ECM packets among the transport packets sent from the TS demultiplexer 225, and extracts the EMM and ECM information.

At step 323, the extracted EMM and ECM information is transferred to the smart card 250. At step 325, the smart card 250 generates a scrambling key based on the EMM and ECM information and sends the scrambling key to the conditional access section 227.

At step 327, the descrambler 228 of the conditional access section 227 decrypts the conditional access code of the transport packets corresponding to the selected program using the scrambling key inputted from the smart card 250. The decrypted digital broadcasting data is then inputted to the decoder module 230.

At step 329, the video decoder 233 and audio decoder 235 of the decoder module 230 decode video data and audio data of the digital broadcasting data, respectively. At step 331, the decoded video data and audio data are outputted through the display section 241 and the speaker 243, respectively. If additional data, such as caption data is included in the digital broadcasting data, it will be decoded by an additional data decoder (not shown) and outputted through the display section 241.

If there is no request for receiving digital multimedia broadcasting from the user at step 301, the DMB receiver will proceeds with step 333 and will determine whether it is requested to reproduce digital multimedia data. In other words, the TS demultiplexer 231 of the decoder module 230 determines whether digital multimedia data has been inputted from the multimedia module 260. Although this specification describes that the DMB receiver determines whether it is requested to reproduce digital multimedia data after determining whether it is requested to receive digital multimedia broadcasting, it will be obvious to one skilled in the art that the order of determining the two requests can be reversed. Also, it is possible to modify the DMB receiver to

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receive digital multimedia broadcasting and reproduce digital multimedia data independently and simultaneously.

If it is determined that digital multimedia data has not been inputted at step 333, the DMB receiver will return to the waiting mode of step 301. If digital

5 multimedia data is inputted, the DMB receiver will proceed with step 335. At step 335, the TS demultiplexer 231 demultiplexes the inputted data and separates the multiplexed video and audio data. Through steps 329 to 331, the separated data will be provided to the user.

Although a preferred embodiment of the present invention has been described

10 for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims, including the full scope of equivalents thereof.

15 **[EFFECTS OF THE INVENTION]**

As described above, the present invention can provide digital multimedia broadcasting and other digital multimedia services in a single terminal. Also, various practical multimedia functions can be easily added to the hybrid multimedia broadcasting receiver according to the present invention. It is possible to produce a

20 small-sized hybrid multimedia broadcasting receiver by minimizing the number of elements added to support practical multimedia services. In addition, the present invention can reduce power consumption by reducing data traffic between chips.

25 **[CLAIMS]**

[CLAIM 1]

A hybrid digital broadcasting receiver capable of reproducing digital multimedia data, which includes a broadcast receiving module and a decoder module,

30 wherein said broadcast receiving module comprises:

a receiving section for receiving and demodulating a digital broadcasting data stream into which a plurality of compressively encoded and scrambled programs are multiplexed and transmitted;

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a first demultiplexer for demultiplexing the demodulated digital broadcasting data stream and extracting digital broadcasting data corresponding to a program selected by a user; and

a conditional access section for detecting conditional access information and decrypting the selected digital broadcasting data using the detected information,

and wherein said decoder module comprises:

a second demultiplexer for demultiplexing a digital multimedia data stream of which a plurality of compressively encoded digital multimedia data are multiplexed; and

a decoding section for decoding digital broadcasting data outputted from the broadcast receiving module and digital multimedia data outputted from the second demultiplexer.

[CLAIM 2]

The hybrid digital broadcasting receiver according to claim 1, further including a smart card for receiving the conditional access information and generating a scrambling key.

[CLAIM 3]

The hybrid digital broadcasting receiver according to claim 2, wherein said conditional access information includes program management information and subscriber management information.

[CLAIM 4]

The hybrid digital broadcasting receiver according to claim 3, wherein said conditional access section receives the scrambling key from the smart card and decrypts the digital broadcasting data.

[CLAIM 5]

The hybrid digital broadcasting receiver according to claim 1, further including a multimedia module for supplying the digital multimedia data stream to the second demultiplexer.

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[CLAIM 6]

The hybrid digital broadcasting receiver according to clam 5, wherein said digital multimedia data consists of audio data and video data.

[CLAIM 7]

The hybrid digital broadcasting receiver according to claim 6, wherein said second demultiplexer separates the audio data and the video data from the digital multimedia data stream.

[CLAIM 8]

The hybrid digital broadcasting receiver according to claim 1, wherein said broadcast receiving module and said decoder module are each formed in a single integrated circuit.

[CLAIM 9]

A hybrid digital broadcasting receiver capable of reproducing digital multimedia data, which includes:

a receiving section for receiving a digital broadcasting data stream into which digital broadcasting data packets and conditional access information packets for a plurality of programs are multiplexed and transmitted;

a first demultiplexer for separating the conditional access information packets and digital broadcasting data packets for a program selected by a user from the received digital broadcasting data stream;

a conditional access section for detecting conditional access information from the conditional access information packets and decrypting the separated digital broadcasting data packets using the conditional access information;

a second demultiplexer for receiving a digital multimedia data stream into which compressively encoded audio packets and video packets are multiplexed and separating the audio packets and the video packets from the digital multimedia data stream; and

a decoding section for decoding digital broadcasting data packets outputted from the conditional access section and audio packets and video packets outputted from

the second demultiplexer,

wherein said receiving section, first demultiplexer and conditional access section are formed in a first integrated circuit chip while said second demultiplexer and decoding section are formed in a second integrated circuit chip.

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[CLAIM 10]

The hybrid digital broadcasting receiver according to claim 9, further including a smart card for receiving the conditional access information and generating a scrambling key.

10 **[CLAIM 11]**

The hybrid digital broadcasting receiver according to claim 10, wherein said conditional access information includes program management information and subscriber management information.

[CLAIM 12]

15 The hybrid digital broadcasting receiver according to claim 11, wherein said conditional access section receives the scrambling key from the smart card and decrypts the digital broadcasting data.

[CLAIM 13]

The hybrid digital broadcasting receiver according to claim 9, further including 20 a multimedia module for supplying the digital multimedia data stream to the second demultiplexer.

[CLAIM 14]

A device for processing digital broadcasting data, which includes:

a receiving section for receiving and demodulating a digital broadcasting data stream 25 into which digital broadcasting data packets and conditional access information packets for a plurality of programs are multiplexed and transferred;

an error correcting section for correcting an error in the demodulated digital broadcasting data stream;

a demultiplexer for separating the conditional access information packets and 30 digital broadcasting data packets for a program selected by a user from the demodulated digital broadcasting data stream; and

a conditional access section for detecting conditional access information from

the conditional access information packets and decrypting the separated digital broadcasting data packets using the conditional access information,

wherein said device is formed in a single integrated circuit chip.

[CLAIM 15]

5   The device according to claim 14, wherein said conditional access information includes program management information and subscriber management information.

[CLAIM 16]

The device according to claim 14, further including a smart card interface for outputting the conditional access information to a smart card and receiving a scrambling

10 key generated by the smart card.

[CLAIM 17]

The device according to claim 16, wherein said conditional access section receives the scrambling key from the smart card and decrypts the digital broadcasting data.

15 [CLAIM 18]

The device according to claim 14, further including a decoder module interface for supplying the decrypted digital broadcasting data to the decoder module.

[CLAIM 19]

A method for providing digital multimedia services in a hybrid digital

20 broadcasting receiver which includes a broadcast receiving module for processing digital broadcasting data and a decoder module for processing compressively encoded digital data, said method comprising the steps of:

receiving at the broadcast receiving module a digital broadcasting data stream into which a plurality of scrambled programs and conditional access information are

25 multiplexed and transferred;

separating the conditional access information and digital broadcasting data for a program selected by a user from the digital broadcasting data stream received at the broadcast receiving module and decrypting the separated digital broadcasting data using the conditional access information;

30   decoding at the decoder module the digital broadcasting data inputted from the broadcast receiving module;

receiving at the decoder module a digital multimedia data stream into which

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compressively encoded audio data and video data are multiplexed; and demultiplexing at the decoder module the digital multimedia data stream to separate the audio data and the video data and decoding the separated audio data and video data.

[CLAIM 20]

The method according to claim 19, further comprising the steps of:

determining whether there is a request for receiving digital broadcasting from the user; and

when it is requested to receive digital broadcasting, driving the broadcast receiving module and receiving the digital broadcasting data stream.

[CLAIM 21]

The method according to claim 19, wherein said conditional access information includes program management information and subscriber management information.

[CLAIM 22]

The method according to claim 20, further comprising the steps of:

supplying the conditional access information to a smart card from the broadcast receiving module;

generating a scrambling key at the smart card using the conditional access information; and

supplying the scrambling key generated by the smart card to the broadcast receiving module to decrypt the separated digital broadcasting data.

FIG.1
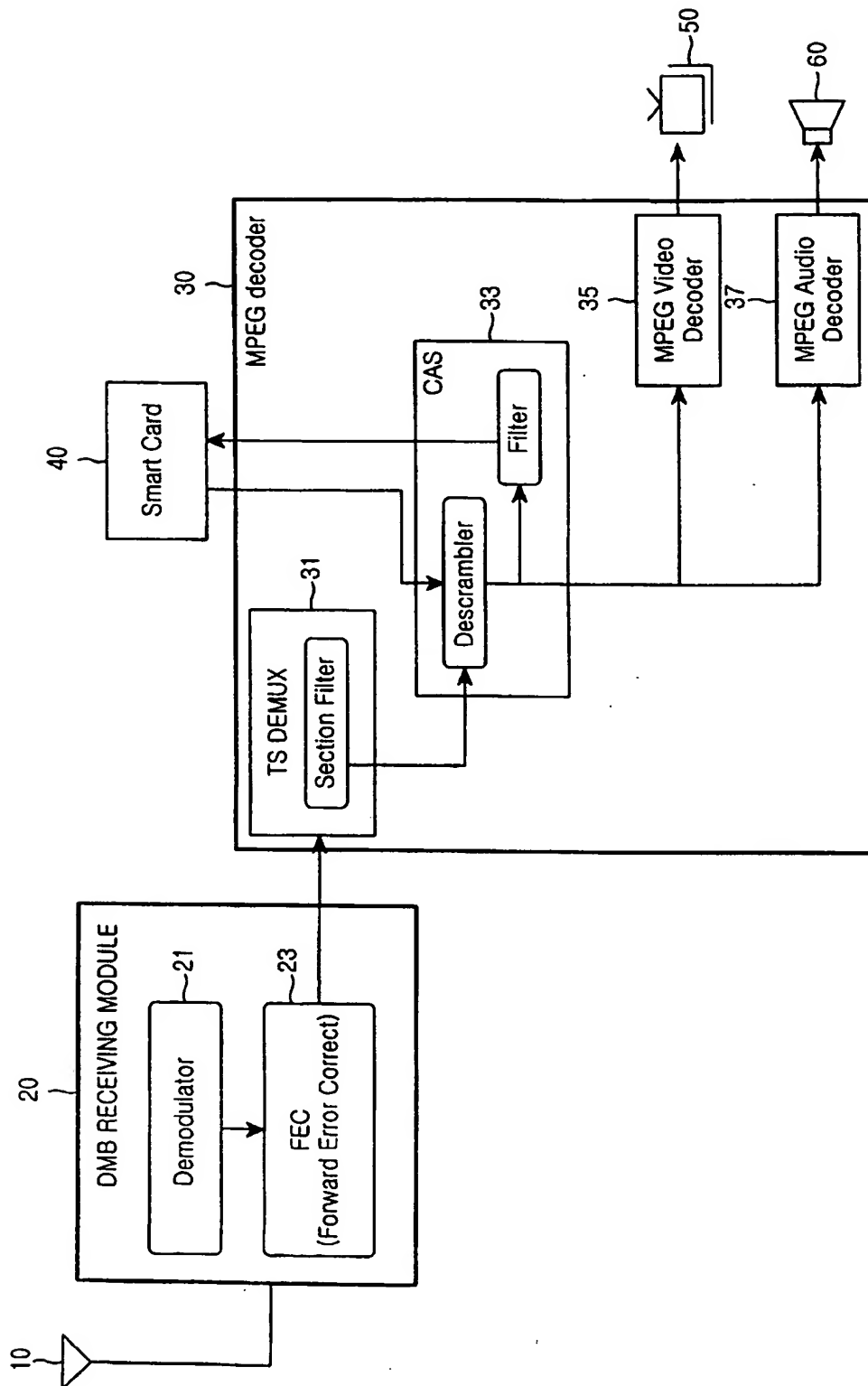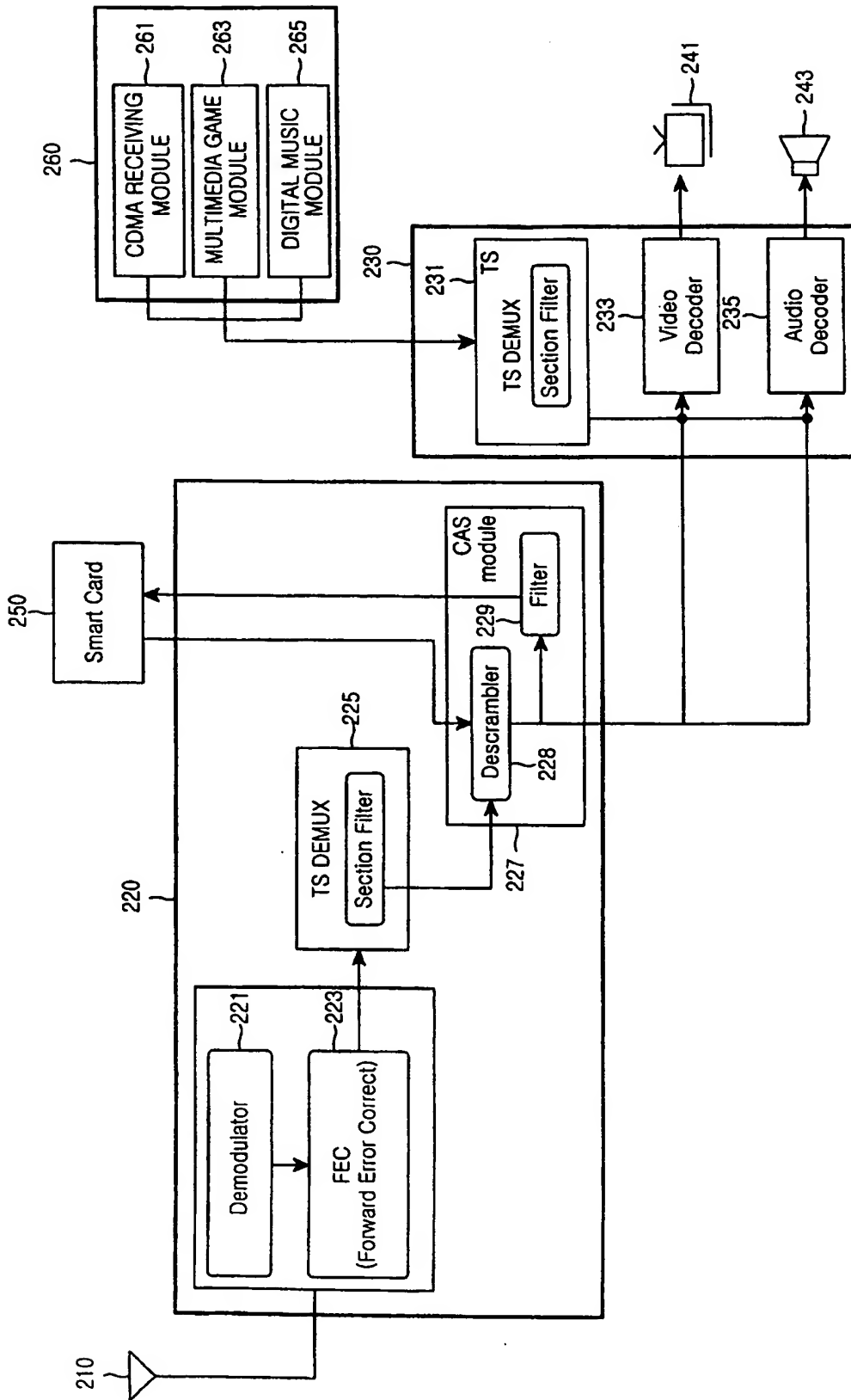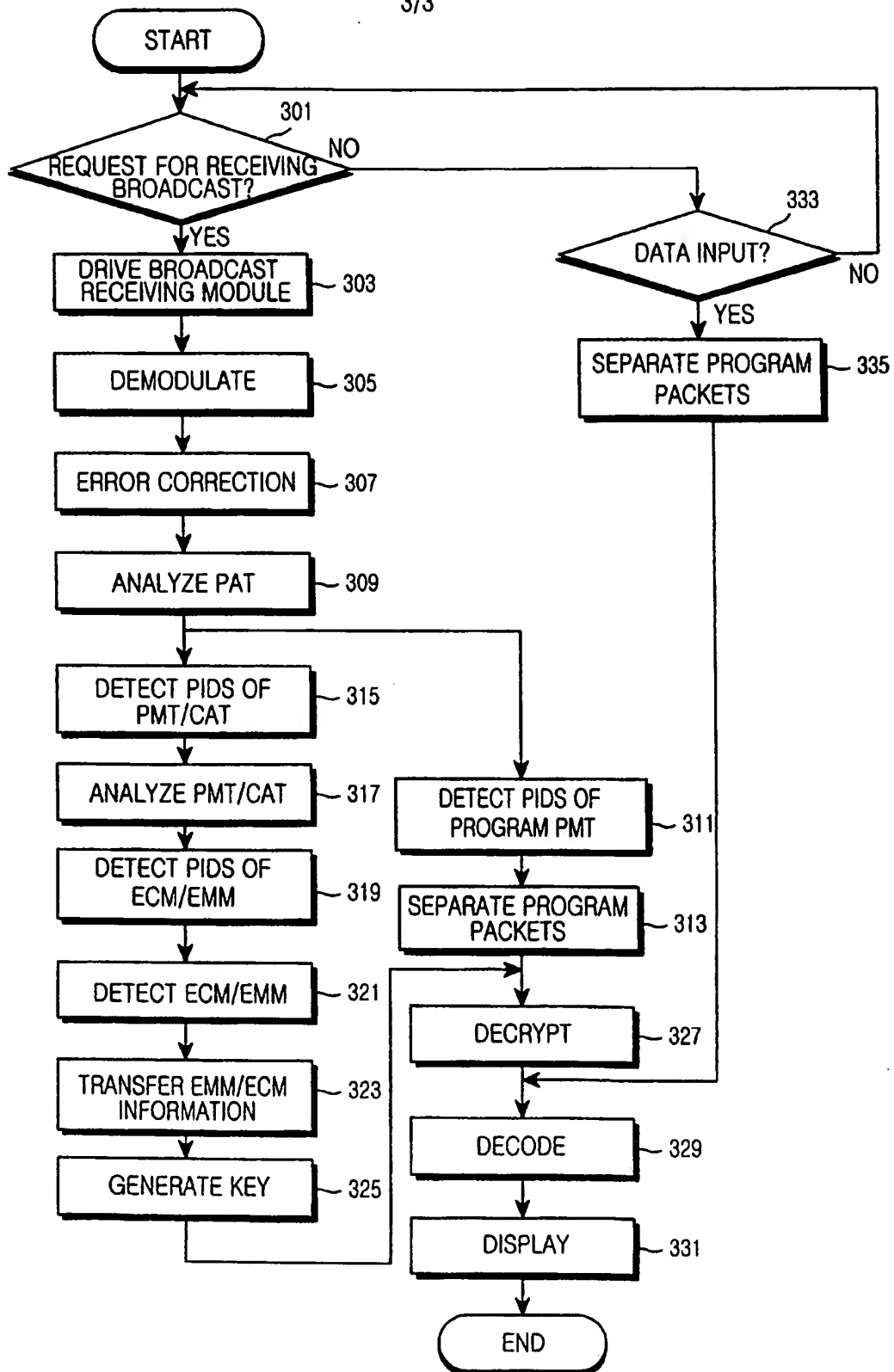
FIG.2

```
                    ┌─────────┐
                    │  START  │
                    └─────────┘
                         │
                     ╱───┴───╲  ─ 301
                    ╱ REQUEST  ╲    NO
                   ╱FOR RECEIVING╲──────────────────┐
                   ╲ BROADCAST? ╱                    │
                    ╲─────────╱                      │
                         │ YES                       │
              ┌──────────────────┐                   │
              │ DRIVE BROADCAST  │─ 303              │
              │ RECEIVING MODULE │                   │
              └──────────────────┘           ╱───┴───╲ ─ 333
                         │                  ╱DATA INPUT?╲──── NO
              ┌──────────────────┐          ╲─────────╱
              │   DEMODULATE     │─ 305           │ YES
              └──────────────────┘      ┌──────────────────┐
                         │              │SEPARATE PROGRAM  │─ 335
              ┌──────────────────┐      │    PACKETS       │
              │ ERROR CORRECTION │─ 307 └──────────────────┘
              └──────────────────┘
                         │
              ┌──────────────────┐
              │   ANALYZE PAT    │─ 309
              └──────────────────┘
                         │
              ┌──────────────────┐
              │  DETECT PIDS OF  │─ 315
              │     PMT/CAT      │
              └──────────────────┘
                         │
              ┌──────────────────┐   ┌──────────────────┐
              │  ANALYZE PMT/CAT │─317│  DETECT PIDS OF  │─ 311
              └──────────────────┘   │   PROGRAM PMT    │
                         │           └──────────────────┘
              ┌──────────────────┐   ┌──────────────────┐
              │  DETECT PIDS OF  │─319│SEPARATE PROGRAM  │─ 313
              │     ECM/EMM      │   │    PACKETS       │
              └──────────────────┘   └──────────────────┘
                         │
              ┌──────────────────┐   ┌──────────────────┐
              │  DETECT ECM/EMM  │─321│     DECRYPT      │─ 327
              └──────────────────┘   └──────────────────┘
                         │
              ┌──────────────────┐   ┌──────────────────┐
              │ TRANSFER EMM/ECM │─323│     DECODE       │─ 329
              │   INFORMATION    │   └──────────────────┘
              └──────────────────┘
                         │           ┌──────────────────┐
              ┌──────────────────┐   │     DISPLAY      │─ 331
              │   GENERATE KEY   │─325└──────────────────┘
              └──────────────────┘            │
                                         ┌─────────┐
                                         │   END   │
                                         └─────────┘
```

FIG.3